Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C. 20554

In the Matter of	)	
Amendments of the Commission's Part 90 Rules in the 904-909.75 and 919.75-928 MHz Bands	)	WT Docket No. 06-49

COMMENTS OF

NEW AMERICA FOUNDATION
MEDIA ACCESS PROJECT
ACORN ACTIVE MEDIA FOUNDATION
ALLIANCE FOR COMMUNITY MEDIA
CENTER FOR DIGITAL DEMOCRACY
CHAMPAIGN-URBANA COMMUNITY WIRELESS NETWORK
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May 30, 2006

Contents

Executive Summary

NAF, *et al.* vigorously oppose adoption of the *Notice* as proposed. The proposed rules virtually replicate the 2002 *Petition* by Progeny LMS, LLC (*Progeny Petition*), which attracted considerable opposition from a broad cross-section of industry groups. Other than the continued failure of the L-LMS Band—a risk reflected in the absurdly low prices the licenses brought at auction—the *NPRM* offers no justification for adopting the proposal.

To the contrary, an objective reading of the facts creates the inescapable conclusion that circumstances since 2002 have made the *Progeny Petition Proposals* even more objectionable and contrary to the public interest. The 900 MHz band has become ever more intensely used by Part 15 "unlicensed" devices ranging from such prosaic but useful and ubiquitous devices as meter readers, to competitive last mile broadband solutions, to critical emergency response equipment.[1] By contrast, the L-LMS licensees have largely failed to complete buildouts and offer service. Further, as the *NPRM* itself observes, numerous other technologies provide similar, or even superior, service of the kind initially envisioned for L-LMS.

Few licensees, however, seem less worthy of the Commission's sudden charity than the M-LMS licensees. The licensees acquired the licenses for a pittance in 1999, fully aware of all of the rules and limitations of the service. When the licensees failed to meet the specified buildout requirements, the Commission responded by extending their deadlines.[2] Further failure on the part of the licensees has brought only additional rewards in the form of further extensions and proposals to expand the licensees' spectrum rights at the expense of those using the band intensely and efficiently.

The Commission appears to have completely abandoned the comprehensive, forward-looking approach painstakingly arrived at by the Spectrum Policy Task Force in favor of a return to its discredited practice of encouraging licensees to speculate and game the Commission's rules.[3] This undermines the efficiency of the Commission's spectrum management policies and encourages speculation as licensees increasingly treat Commission obligations such as buildout requirements and service limitations as suggested guidelines the Commission will modify on request rather than as rules they must obey.

As the licensees received their licenses at auction,[4] it would well serve the Commission to recall the justification given for auctions, and how continuing to grant new rights to licensees undermines auction efficiency. Supporters of auctions (a practice NAF, *et al.* generally oppose) argue that distribution of clear and certain spectrum rights by auction

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[1] *See, e.g.,* Jeff Allen, "Radio Response's Activities Following Hurricane Katrina," March 6, 2006 at p.12 (presented as testimony before the FCC's Hurricane Katrina Independent Panel Review).
[2] *See, e.g., Request of Warren C. Havens for Waiver of the Five-Year Construction Requirement*, 19 FCCRec 23742 (2004).
[3] *See, e.g., Nuclear Energy Institute,* ET Docket No. 05-345.
[4] *See* Public Notice, "Location and Monitoring Service Auction Closes," WT 99-6, March 5, 1999.

allows parties to asses the potential value of the license. The payment, in theory, provides incentive for the licensee to deploy the spectrum swiftly and efficiently, thus maximizing value to the public.[5]

Accordingly, when the Commission indicates it will expand rights at the request of the licensee, it encourages speculation and spectrum warehousing. Parties bid for licenses not because they genuinely believe the license offered has value, but because they believe they can subsequently improve the value by regulatory arbitrage. For those who favor exclusive licensing, such conduct undermines the value of the licenses auctioned, since parties cannot assess their value accurately and have a strong incentive to disregard buildout requirements or other restrictions. Worse, it devalues the rights in ***all*** licensed services, since any licensee can hope to similarly manipulate the Commission and gain significant financial rewards from flouting the Commission's rules and denying the public the benefit of the public spectrum asset.

One may argue, as NAF, *et al.* have, that this inefficiency in exclusive licensing demonstrates the essential fallacy of preferring auctions and exclusive, property-like licenses to a more commons-oriented approach. But one need not embrace this argument to conclude that granting the NPRM rewards spectrum scofflaws and speculators, encouraging such practices not merely here but in all licensed bands. That this comes at the expense of rule-abiding developers and users that have invested billions of dollars and provide incalculable public interest benefit merely adds insult to industry.

Accordingly, NAF, *et al.* urge the Commission to abandon the proposed rules. Instead, if the Commission genuinely wishes "to evaluate whether it is possible to revise our rules in a way that would promote more efficient and effective use of this spectrum,"[6] the Commission should take steps to reclaim the M-LMS spectrum licenses and consider proposals to enhance shared use of the band by those who have used it most effectively and intensively—the Part 15 unlicensed operators. Such action would send a clear message to all users of spectrum, both licensed and unlicensed, that the Commission rewards users who maximize intensive and efficient use of spectrum and abide by the rules, rather than rewarding speculators and scofflaws that treat the Commission rules as an invitation to negotiate for further privileges while withholding service to the public.

In addition to a general inquiry into how to improve the ability of the public to maximize use of the 900 MHz band pursuant to Part 15's non-exclusive "unlicensed" regime, NAF, *et al.* provide two specific suggestions the Commission can implement immediately.[7]

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[5] *See generally,* Thomas Hazlett, "The Wireless Craze, The Unlimited Bandwidth Faux Pas, and the Punchline to Ronald Coase's 'Big Joke,'" 14 *Harvard Journal of Law & Technology* 335 (2001).

[6] *NPRM* at ¶4.

[7] Because the Commission solicited comment on all proposals that "consider the spectrum access needs of multiple users and to evaluate any proposals that may improve access and use of the band by both M-LMS and Part 15 operations," the proposals to expand Part 15 access fall within the clear scope of the rulemaking. Further, because NAF, *et al.* do not propose immediate revocation of L-LMS licenses, but rather urge that the Commission rigorously enforce its existing rules and license limitations, the proposal that the Commission act to reclaim L-LMS spectrum from licensees does not fall outside the scope of the *NPRM* or constitute a change in the rights of licensees.

First, the Commission should permit greater power for Part 15 devices in highly rural areas. This will allow operators to use valuable spectrum efficiently and intensely where wired broadband Internet networks are most costly to deploy. Second, the Commission should consider, in the absence of M-LMS licensees, whether it can allow more flexibility for outdoor use of Part 15 devices.

The rule changes proposed in the *NPRM* represent a startling reversal from the path laboriously arrived at and embraced by the Commission in the *Spectrum Policy Task Force Report*. The failure to justify this departure on the basis of any concrete evidence that the proposal will serve the public interest—especially when contrasted with the voluminous evidence that grant of the proposed rules will undermine spectrum efficiency, undermine the Commission's rules, and undermine further deployment and investment in the band by its most efficient and intensive users—makes this departure from stated Commission policy even more arbitrary and capricious. If this *NPRM* serves to bring any public interest benefits, it will be in the form of improving unlicensed access to the band.

Introduction

This Notice of Proposed Rulemaking was instigated by Progeny's Petition for Rulemaking filed on March 5, 2002.[8] Progeny's Petition sought to revise the service rules in the 902-928 MHz band for multilateration location and monitoring service (M-LMS). The FCC issued these service rules in 1995 after extensive deliberations on how to protect unlicensed users in the band.[9] These rules, in turn, revised the original 1974 M-LMS service rules (then called "AVM" for "Automatic Vehicle Monitoring").[10]

The 1974 rules, adopted in response to a petition, resulted in no significant service to the public. In the early 1990s licensees petitioned the FCC for a rule liberalization to allow the band to be used for cellular telephone services and other new services. After collecting a long record, the Commission in 1995 rejected most of the requests for new use because of their impact on other users of the band. Now, the post-1995 licensees, having failed to meet their construction requirements, are trying to reopen the 1995 decision with the same types of requests that led to the 1995 decision in the first place. But with tens of millions of unlicensed devices now in this band, their argument is even weaker in 2006 than it was in 1995.

This band has extremely complex sharing among many services and is governed by 6 footnotes in the US allocation table.[11] It appears that the "pecking order" for this band is as follows:

1. Industrial, Scientific, and Medical Equipment , e.g., microwave ovens
2. Federal Government radiolocation
3. Federal Government mobile and fixed
4. LMS
5. Amateur Radio
6. Part 15

There is anecdotal evidence that Federal Government mobile and fixed use of the band has decreased significantly over the years but that Federal Government radiolocation, particularly the ship-borne high power AN/SPS-49 air surveillance radar,[12] persists in this band. At present, all these users peacefully coexist in this band under existing policies and rules.

In 1999 and 2001, Progeny spent $2.36 million at auction to purchase licenses to provide M-LMS service. Progeny purchased 228 of 528 licensees and became the largest M-

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[8] Petition for Rulemaking in the matter of Amendment of Part 90 of the Commission's Rules Governing the Location and Monitoring Service to Provide Greater Flexibility, Progeny LMS, LLC, March 5, 2002.
[9] PR Docket No. 93-61, Amendment to Part 90.
[10] Report and Order, Docket No. 18302, 30 RR 2d 1665 (1974).
[11] *See* 47 CFR 2.106, footnotes 5.150, US215, US 218, US267, US275, G11.
[12] *See* https://wrc.navair-rdte.navy.mil/warfighter_enc/weapons/SensElec/RADAR/ansps49.htm, http://www.globalsecurity.org/military/systems/ship/systems/an-sps-49.htm, and http://www.itnu.de/radargrundlagen/19.kartei/karte502.en.html.

LMS licensee in the 902-928 MHz band, which is shared with more than 100 million unlicensed devices. In addition to the 528 licenses auctioned under the new service rules, other M-LMS licenses were assigned prior to the beginning of the M-LMS auction era and the new 1995 M-LMS service rules. For the list of the seven M-LMS licensees and their spectrum holdings, see Appendix B.

Progeny's petition is most striking not for what it says but for what it doesn't say. The 32-page petition directly refers to "unlicensed" or "part 15" devices only three times. More importantly, we are told countless times of the consumer benefits of what Progeny is proposing, but nowhere is there an explicit acknowledgment that this would come at an incalculable cost to potentially tens of millions of unlicensed users. Nor does Progeny ever acknowledge the existence of the primary Federal Government radiolocation systems in this band or state that its proposed new services will neither cause interference to nor be severely impacted by interference from high power military radars.

On May 7, 2002, the FCC released a public notice seeking comment on Progeny's Petition for Rulemaking.[13] This notice attracted a firestorm of comments, mostly from unlicensed manufacturers and their trade associations, who immediately recognized the harmful impact Progeny's proposals would have, if implemented, on unlicensed operation. Through December 13, 2005, the notice received 155 comments.

Why the FCC, almost four years later, has chosen to follow up with a Notice of Proposed Rulemaking is unclear. Many of the 155 comments already on file are brief and duplicative *ex partes*. But there are also dozens of extended, carefully argued comments, the great majority of which strongly oppose what Progeny requested. NAF, *et al*. has found those critical comments compelling. Although this is a "fresh" proceeding, we encourage the FCC to carefully review the comments made by the following companies, standards setting bodies, and trade associations (listed alphabetically):

802.18
Agere Systems
American Public Power Association (APPA)
Axonn
Cellular Telecommunications & Internet Association (CTIA)
City of Buffalo
FreeWave Technologies
GE-Interlogix
Inovonics Wireless
Intermec Technologies
ISP Wireless Group
Itron
License Exempt Alliance.
Northwest Telephone Cooperative Association
Ricochet

[13] Public Notice DA 02-817, "Wireless Telecommunications Bureau Seeks Comment on Petition for Rulemaking Regarding Location and Monitoring Service Rules", May 7, 2002.

SchlumbergerSema
WaveRider

In essence, these comments dispute Progeny's claim that the rights of M-LMS license holders can be significantly expanded without any adverse impact on unlicensed service in the 902-928 MHz band. Some of the comments go further and argue that M-LMS licensees should forfeit their licenses since they have not done what they were granted their licenses to do, have not met their construction deadlines, and have themselves acknowledged that their business plan was fatally flawed.

It is noteworthy that of the seven M-LMS licensees, only two—Progeny and Warren Havens—filed comments in this proceeding. Warren Haves was the second largest licensee in the band, with 95 licenses. One likely explanation for this limited participation is that the smaller M-LMS licensees have attempted to free ride on the efforts of their larger counterparts. Another possibly related explanation is that overtly supporting Progeny's Petition, with its contention that M-LMS is a failed service, could have endangered their requests for extensions on their construction deadlines. The FCC does not generally grant construction deadline extensions when the service for which the license was granted is obsolete.

Two potential vendors for Progeny also filed comments in support of Progeny. But these commentators only appeared early in the proceeding and filed tentative and remarkably unsubstantive remarks.

In its NPRM, the FCC appears deeply ambivalent about its willingness to tolerate harm to unlicensed service in this band. On the one hand, the NPRM appears to say it will not allow M-LMS licensees to expand their rights at the expense of unlicensed service. For example, it says that any change to M-LMS licenses must "ensure the same degree of access for Part 15 devices that exists today."[14] On the other hand, this principle is undercut in at least a half dozen other places, where hedging language is used, leaving the impression that the FCC might in fact tolerate substantial harm to unlicensed service.

For example, the NPRM says (italics added) changes cannot result in "*major* changes to Part 15 devices," implying that "minor" changes are okay. It says that Part 15 devices should "not suffer from any *significant* increase in interference from a flexible M-LMS service" without clearly defining "significant."[15] It asks "What power and other technical limits would be appropriate and enable users of Part 15 devices to continue to operate in the band without *unreasonable* interference?" but "unreasonable" is left undefined.[16] Most strikingly, it tentatively proposes relegating unlicensed to the 12 MHz of the 26-MHz band where M-LMS does not currently have any rights.

Moreover, ensuring the "same degree of access for Part 15 devices that exists today" ignores what is most at stake in this proceeding: emerging and *future* innovation on what

[14] NPRM at ¶38.
[15] NPRM at ¶33.
[16] NPRM at ¶32.

is today the only commercially useful unlicensed band in the high-penetration frequencies below 2 GHz.[17] Innovation and growth in unlicensed networking and broadband applications is just beginning.[18]

The NPRM also appears to have a bias toward licensed spectrum. On the one hand, it seeks "to reach an appropriate balance between [licensed and unlicensed] users." On the other hand, every one of its proposed rules suggests tilting the balance in favor of licensed users (users who have failed to use the spectrum in large part because there are now close substitutes available for their services on other bands). On the one hand, the NPRM states as its goal "to evaluate whether it's possible to revise our rules in a way that would promote more efficient and effective use of the spectrum."[19] On the other hand, it doesn't consider the possibility that enhancing unlicensed use might further that goal.

NAF, *et al*. encourages the FCC to consider a new balance in this band that explicitly favors unlicensed access and innovation, which has been by far the most productive service in this band and should be rewarded rather than penalized for its success.

Basic Findings

During the past decade, the FCC and the workings of the marketplace have developed a large record that should serve as the factual basis of this NPRM. This record includes:

1) Extensive debate over developing service rules for this band, leading up to the FCC's 1995 Report & Order.
2) Extensive debate from 2002 through 2005 generated by Progeny's petition to revisit that earlier debate and expand the rights of M-LMS licensees.
3) Abundant real life market trials of the competing services in this band, including seven years of post-auction M-LMS non-service combined with massive growth of unlicensed service. It is important that these lessons from history not be ignored in this proceeding.

NAF, *et al*. believes that the findings derived from this record include the following:

1) M-LMS is a failed business model.
2) 900 MHz unlicensed service is thriving.
3) Granting M-LMS licensees more than a non-trivial amount of additional spectrum flexibility will harm unlicensed service.

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[17] *See* J.H. Snider, "Myth vs. Fact: The Rhetoric and Reality of Progress in Allocating More Spectrum for Unlicensed Use," New America Foundation, February 2006. Available at: http://www.newamerica.net/Download_Docs/pdfs/Doc_File_2897_1.pdf.

[18] *E.g., see* J.H. Snider, "Reclaiming the Vast Wasteland: The Economic Case for Re-Allocating the Unused Spectrum (White Space) Between TV Channels 2 and 51 to Unlicensed Service," New America Foundation, February 2006. Available at: http://www.newamerica.net/Download_Docs/pdfs/Doc_File_2898_1.pdf.

[19] NPRM at ¶4.

4) As long as there are M-LMS licensees, they will have strong incentives to leverage their existing licenses—using every conceivable excuse—to win a spectrum windfall at public expense.
5) The FCC's willingness to continually revisit the unlicensed service rules in 902-928 MHz is creating harmful uncertainty for unlicensed manufacturers and users, potentially undermining U.S. broadband deployment and innovation.

The "safe harbor" provisions of §90.361 have given Part 15 operators reasonable administrative certainty as well as avoiding significant transaction costs for both the Commission's limited enforcement resources and the users of the band. Any tinkering with §90.361 could result in significant increases in administrative burden for the Commission and users due to resulting uncertainties.

M-LMS is a failed business

There appears to be no serious dispute by either the FCC or incumbent M-LMS license holders that M-LMS—just like its predecessor in this band, AVM—is a failed business. The NPRM observes that "there has been very limited development of M-LMS service under the existing rules."[20] It also observes that "none of the six license holders that received their licenses through these auctions or by subsequent transfer or assignment are providing vehicle location services (or any other Part 90 M-LMS complaint service) with their spectrum."[21] When the 1995 rules were adopted, low cost Global Positioning System terminals were not widely available and the Commission decided that general marketplace policies supported an alternative technology for geolocation. Now, low cost GPS and D-GPS equipment is widely available and geolocation can be accomplished without the need for dedicated non-Federal Government spectrum. The final implementation of DTV in 2009 will, in turn, offer new options for geolocation as a byproduct of the wide coverage 6 MHz digital signals of DTV transmitters. The M-LMS proponents made a bet on a technology in the 1990s and the Commission stuck with its policy of "not picking winners and losers." Now the losers are asking for yet another rule revision at the expense of more successful business models.

Progeny itself acknowledges on numerous occasions that M-LMS in and of itself is not a viable business. Indeed, that is the premise on which its petition is based: "[T]he 900 MHz LMS industry is saddled with service and technical limitations that have blocked the licensees' ability to provide service successfully, and which, unless removed, may doom the service."[22] Progeny notes that it has gone to numerous vendors to provide LMS equipment and none believes that M-LMS licenses provide the basis for a viable business model: "Progeny has diligently been seeking to implement service, but it has been unable to do so because of, *inter alia*, the absence of suitable equipment…. Manufacturers do not perceive that there is a market, given current regulatory restraints, to justify such significant investments."[23] Finally, in seeking to get the FCC to act quickly, Progeny goes so far as to assert that if the FCC doesn't act quickly (and this was more than four

[20] NPRM at ¶1.
[21] NPRM at ¶11.
[22] *Supra* note 2, p. 6.
[23] *Ibid.*, p. 15.

years ago), then even if it receives all the requested spectrum flexibility, it might be too late for a successful business:

> "[t]he Commission must act expeditiously to allow LMS to be developed and deployed, with a full range of services and applications, as CMRS providers are developing and deploying their location technologies. If LMS licensees are further delayed in rolling out their services, due to the current regulatory framework, CMRS providers are likely to gain an insurmountable advantage in the marketplace through more timely roll-outs of service, backed by the advertising and marketing prowess of these already-established mobile market players."[24]

Warren Havens, the other M-LMS licensee to file, makes the same observation, although less pointedly (italics added): "This Petition proposes major amendments to the Commission's Rules for the Location and Monitoring Service for the entire 902-928 MHz band…. These proposed amendments are designed to *allow LMS to be a viable service*."[25]

Various commentators also repeatedly make this point.

> **CTIA.** "LMS had its genesis as a service intended to track stolen automobiles, and the Commission's service rules were developed with the assumption that LMS licensees would provide a service limited to the ability to track and monitor goods and/or people. Now there are many competing, substitutes, including more than 200 million consumer mobile handsets with government mandated 911 location service. Virtually every new wireless consumer broadband device, including WiFi, DTV, and digital radio, incorporates location services. This suggests that Progeny's business model, not FCC rules, lies at the heart of its business failure."[26]
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> **GE-Internlogix**. "[T]he investment in LMS licenses has turned out to be much like the now discredited investments in internet stocks. In both cases, the product was over-valued. In both cases, little due diligence was performed. The difference is that those who bought the internet stocks, operating in a real marketplace, have no expectation that the SEC will help them to swap their worthless stocks for other stocks that may be more valuable. But those who acquired licenses in spectrum auctions seem to believe that their lack of judgment can always be forgiven by the Commission, even at the expense of others."[27]
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> **Agere Systems**. "It should not be the function of the Commission to bail out ill-conceived, unsuccessful business plans that are based on an apparent lack of due

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[24] *Ibid*., p. 31.
[25] Comments of Warren C. Havens and Telesaurus Holdings GB, LLC, RM No. 10403, May 15, 2002, p. 24.
[26] Comments of CTIA, RM No. 10403, June 3, 2002, p. 2.
[27] Reply Comments of GE-Interlogix, RM No. 10403, p. 5.

> diligence on the part of the licenses, by changing its rules to convert their business to something radically different, and very much like, existing, successful competitive services (of which there are no scarcity)."[28]

There are two M-LMS licensees, Teletrac and Ituran, that the FCC says have at least some operations in this band. But there are a number of points that are noteworthy about these operators. They acquired their M-LMS licenses prior to the era in which the FCC began to auction M-LMS licenses. Compared to the M-LMS licensees who acquired their licenses at auction, they have minimal spectrum holdings and fulfilled their original construction requirements. They did not file in response to Progeny's petition. They are international businesses—one is based in Israel and the other in the U.K.—that provide the vast majority of their location and monitoring services, both inside and outside the U.S., without recourse to the 902-928 MHz band. They only use a small fraction of the 902-928 MHz band and in a small geographic footprint. For example, Teletrac only appears to sell LMS equipment in the 902-928 MHz band in five markets while using only 20 KHz in each market (with 908 MHz the transmit frequency and 927.778 MHz the receive frequency). These two companies will be discussed in more depth later in these comments.

Underlying the failure of M-LMS are a few simple and obvious economic forces. First, M-LMS service faces many lower cost substitutes. Second, computers and radio have both evolved to become general purpose devices with massive economies of scope. That's what is meant by the trend toward "convergence." Building a smart radio to deal with a narrow application has increasingly become a highly inefficient business proposition. It would be like building separate computers for word processing, spreadsheet, and contact management functions.

900 MHz Unlicensed is a thriving market

In contrast to the virtually complete failure of M-LMS service in the 902-928 MHz band, unlicensed service in that band is thriving. The NPRM acknowledges this fact. It states, for example, that "[t]hese unlicensed Part 15 devices" number "in the millions"[29] and that in recent years "there has been major growth in a number of classes of part 15 devices in the 902-928 MHz band." (para. 15). Then it goes on to list the type of devices:

- RFID devices, such as bar code readers, different types of tag readers, and security label readers.
- Utility and reading devices, such as readers for gas and electric meters, water meters, and remote sensors for these readers.
- Telemetry and security devices, such as alarm devices, vehicle tracking systems, fork lift and crane control systems, traffic control systems, and home security systems.
- Medical devices, such as blood pressure and heart rate monitors, medical telemetry systems, and fetal monitoring systems.

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[28] Comments of Agere Systems, RM No. 10403, September 4, 2002.
[29] NPRM at ¶5.

- Consumer electronics devices, such as wireless speakers, intercom devices, wireless keypads and mouse controllers, baby monitors, and video cameras.
- Network devices, such as broadband Internet base stations and access points.[30]

The NPRM also notes that the number of Part 15 authorizations in the 902-928 MHz has almost doubled—to 384—since M-LMS was auctioned in 1999,[31] yet there is not a single piece of licensed equipment used by the M-LMS operators who acquired licenses in the 1999 auction.

Unfortunately, the authorization database is highly limited because it doesn't provide information on how many devices have been built using a single type of authorized equipment. For example, a single authorization for an RFID device can result in tens of millions of devices, but this wouldn't show up in the FCC's authorization database.

Unfortunately, too, neither the FCC nor any private entity keeps comprehensive track of the sales of unlicensed devices in this band. Nevertheless, it's clear that there must be at least 100 million unlicensed devices in the band. The gas, electric, and water meter industry alone has sold at least 56 million meters in this band. When Itron filed comments, it stated that as of 2002 it had sold 20 million meters in the band. Now, as of 2005, it says the number has increased to 46 million.[32] As of 2002, SchlumbergerSema said in its filed comments it had sold 10 million meters.[33] By now, it has very likely sold many more. The charts in Appendices D and E, taken from Itron's and Schlumberger's filed comments, show their steadily increasing use of the 902-928 MHz band.

In addition to the meter reading companies, there have been many tens of millions of cordless phones sold that use this band. The type of overseas companies that produce most of these phones tend not to file in FCC proceedings. But CEA reports show that sales of cordless phones run around 40 million/year.[34] (Closely related products such as 900 MHz cordless headphones and wireless speakers are not included in these figures.) There is no breakdown of cordless phone sales by unlicensed band. The prime advantage of the 900 MHz band over the 2.4 GHz and 5 GHz bands is its propagation characteristics. Phone signals in the 5 GHz band, for example, tend to get blocked after passing through a few walls or floors—a serious problem for today's large, three-story, ten-room or more, American homes. On the other hand, the 902-928 band is only a fraction of the size of the 2.4 GHz and 5 GHz bands and has traditionally only supported single-line cordless phones.

What explains the success of unlicensed service in the 902-928 MHz band? There are undoubtedly many factors. There is widespread agreement that the propagation characteristics of lower frequency spectrum make it generally more valuable for

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[30] NPRM at ¶15 and ¶16.
[31] NPRM at ¶13.
[32] *Ex Parte* Comments of Itron, RM No. 10403, June 4, 2003; conversation with Itron counsel Henry Goldberg on May 11, 2006.
[33] *Ex Parte* Comments of SchlumbergerSema, RM No. 10403, December 15, 2003.
[34] "U.S. Consumer Electronics Sales and Forecasts, 2000-2005," CEA Market Research, January 2005.

personal/portable communications and other types of communications where trees, weather, walls, and other obstacles can block communications. This is true regardless of whether the communications device is licensed or unlicensed. The 902-928 MHz band is also the only unlicensed band below 2 GHz that allows flexible unlicensed devices,[35] so this is where unlicensed users have to go if they want use of that type of spectrum.

On the other hand, the 902-928 MHz band also has a number of serious disadvantages unrelated to its propagation characteristics. It is a relatively small unlicensed band, which means that broadband services may be better off in the 2.4 GHz and 5 GHz band. Unlicensed users are ranked fourth in priority behind military users, LMS users, and amateur radio users. All of these services can operate at substantially higher power than unlicensed service and thus create a potential for significant interference with unlicensed service. This potential conflict creates special problems for unlicensed use in the 902-928 MHz band that are missing in, say, the 2.4 GHz unlicensed band. Another problem is that the licensed users have consistently lobbied for more rights at the expense of the unlicensed users. This creates uncertainty for both manufacturers and users. Lastly, the complicated band plan, where different services are granted different rights to different bands, may mean that the effective bandwidth for many services is less than 26 MHz. For example, since M-LMS is given exclusive high power rights to 14 MHz of the 26 MHz, the effective, risk-free bandwidth for an unlicensed device manufacturer concerned with interference from high power M-LMS is only 12 MHz, not 26 MHz.

Granting M-LMS licensees more than a non-trivial amount of additional spectrum flexibility will harm unlicensed service

The NPRM states it doesn't want to expand the rights of M-LMS licensees at the expense of unlicensed service. The question is: can M-LMS licensees be granted more than a non-trivial amount of additional spectrum flexibility without harm to unlicensed service? NAF, *et al*. believes that the same question has been asked again and again and again over more than a decade and the answer has always been the same: "no." This NPRM, rather than propose a specific set of service rules as most NPRMs do, actually does little more than ask the same questions it has asked before. Therefore, we expect it to get the same response it has always gotten in the past; that is, granting M-LMS licensees even a fraction of the spectrum flexibility they desire will do great harm to the future of unlicensed service in this band.

It is true that this NPRM is designed to be a "fresh" proceeding. Yet with only minor exceptions this NPRM raises the same flexibility proposals already raised and discussed in the FCC's Notice generated by Progeny's petition for more spectrum flexibility. A clear consensus emerged from those filings that significantly increasing flexibility for M-LMS operators would have to come at the expense of unlicensed service and that any claims to the contrary have not been able to withstand rigorous scrutiny and should therefore be relegated to the category of "perpetual motion machine inventions."

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[35] *See supra* note 11.

Progeny argued in its Petition and in its following white paper that more spectrum flexibility for M-LMS licensees would not come at the expense of unlicensed: Its Petition, for example, argues that the FCC has authority to grant Progeny's request for spectrum flexibility if "such use would not result in harmful interference among users" and "such use would not deter investments in communications services and systems."[36] Progeny then asserts that "these conditions are applicable to the LMS spectrum" and that Progeny's proposals, when compared to the FCC's current protection of unlicensed services, will "provide equally effective protection against the risk of harmful interference to the primary services and secondary services sharing this band with LMS."[37]

Its subsequent white paper, which attempted to provide engineering backing for these assertions, concluded:

> "The analyses contained in this paper illustrate that even 'high-density' LMS systems do not present at interference risk to Part 15 devices significantly greater than the inherent interference risk from other Part 15 devices. The examination of comparative power levels, combined with band occupancy considerations, indicate that additional flexibility for LMS systems will not cause an unacceptable level of interference to Part 15 devices."[38]

But manufacturers of unlicensed equipment in the 902-928 MHz were not convinced by Progeny's arguments. Here is a sample of their comments:

> **FreeWave Technologies**: "Should the Commission lift the restrictions on the types of services that LMS operators may provide and eliminate the safe harbor provision, the resulting congestion in the 902-928 MHz band will be catastrophic to Part 15 users."[39]
>
> **GE- Internlogix:** "[T]he real effect of [Progeny's] proposal would be to reduce in half the size of the band where Part 15 devices could operate at all… [T]he effect of offering the LMS licenses the flexibility Progeny requests would be to greatly increase the use of the band, ultimately destroying the ability of Part 15 devices to operate."[40]
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> **SchlumbergerSema:** "Progeny's requests for increased bandwidth and service and technical flexibility would translate into substantially different LMS operations, leading to considerable and potentially devastating interference created by LMS licensees to Part 15 users."[41]

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[36] *Supra* note 2, p. 14.
[37] *Ibid*., p. 15.
[38] "LMS Compatibility with Part 15 Devices: The Case for Spectrum Flexibility," Progeny LMS, LLC White Paper, October 8, 2002, p. 16.
[39] *Ex Parte* Comments of FreeWave Technologies, RM No. 10403, February 24, 2003, p. 2.
[40] *Supra* note 21, p. 4.
[41] Comments of SchlumbergerSema, RM No. 10403, June 12, 2003, p. 2.

Highly respected manufacturers did their own engineering analyses and specifically critiqued Progeny's white space paper. These comments are from manufacturers of tens of millions of meters in the 900 MHz band:

> **Itron**: "Itron disagrees with the flawed analysis and the erroneous conclusions reached in the Progeny White Paper with respect to the risk of interference from Location and Monitoring Service ("LMS") operations to Itron's automatic meter.[42]
>
> **Intermec:** "Intermec's engineers have thoroughly reviewed Progeny's white paper and find that Progeny makes numerous errors and questionable assumptions in its comparative analysis of LMS and Part 15 interference which lead ultimately to inaccurate interference conclusions."[43]
>
> **SchlumbergerSema:** "Progeny's assertion that its system, which is at least ten times more powerful than Part 15 spread spectrum devices, would 'not present an interference risk to Part 15 devices that is greater than the inherent risk already present from other Part 15 devices', cannot be supported by the facts, and is wrong as a technical matter."[44]

Even one of the M-LMS licensees, Warren Havens, critiqued Progeny's white paper.

> "Progeny alleges that its White Paper supports its 4-point request for rule changes (see page 1 of the White Paper), but it does not support any of these 4 items…. As noted above, the White Paper does not involve the range of assumptions and make the range of simulations needed for a study to meaningfully model the effects by a LMS-M operation on various Part 15 device operations (or vice versa). Any useful model must simulate, for both LMS-M and Part 15, commercially viable services with large number of base and end-user transmitters over a large area with high traffic. (If high traffic is not simulated, then the simulation is of a failed, non-viable, or spectrum-inefficient service.) The White Paper does not do this."[45]

Warren Havens' motives for critiquing the Progeny white paper are hard to ferret out. But a lack of bluntness does not appear to be one of his character traits.

In contrast to Progeny, Warren Havens was much more explicit that his vision for expanded spectrum flexibility for M-LMS licensees would have to come at the expense of unlicensed service. In his initial comments, for example, Warren Havens says: "Without phasing out or reducing part 15 devices in this 900 MHz band, development of LMS-M technology and network deployment will suffer."[46] He then offers a specific

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[42] *Ex Parte* Comments of Itron, RM No. 10403, January 10, 2003, p. 1.
[43] *Ex Parte* Comments of Intermec Technologies, RM No. 10403, March 20, 2003, p. 3.
[44] *Supra* note 35, p. 1.
[45] E-mail from Warren Havens to David Furth, February 3, 2003, pp. 3, 5.
[46] Comments of Warren C. Havens and Telesaurus Holdings GB, LLC, RM No. 10403, p. 17.

proposal titled "Part 15 phased out of 902-928 MHz", followed by this simply-stated text: "No new consumer devices would be permitted on the market after the end of year 2005, and no external part 15 systems operations (via fixed outside buildings or intended to transmit outside) would be permitted after end of year 2005."[47] In his *ex parte* comments he is even blunter: "It is a waste of ideal mobile spectrum to use it for Part 15 devices."[48]

Warren Havens' proposal received stinging rebukes from the unlicensed manufacturers. GE- Internlogix, for example, replied:

> "The Warren Havens proposal is admirable only for its simplicity. Warren Havens would remove all Part 15 devices in the 902-928 MHz band from the market in three years and not permit further operation of Part 15 systems using outside antennas after three years. Period. No thought is given to the huge existing infrastructure investment of Part 15 manufacturers and users. Certainly, no thought is given to the millions of consumers who enjoy and have grown dependent on the various Part 15 devices they use."[49]

The NPRM clearly doesn't embrace, let alone mention, Warren Havens' proposal. Indeed, it would appear that Warren Havens' proposal would be self-defeating because, according to Progeny's legal reasoning, the FCC lacks authority to eliminate Part 15 service in the 902-928 MHz band. Nevertheless, it is clear that Warren Havens' proposal represents the long-term agenda of Progeny and presumably others seeking to expand the rights of M-LMS users in this band.

Cutting away the mountains of verbiage and technical analysis, there is one simple reason why expanding M-LMS will harm unlicensed service. The FCC carefully designed M-LMS to be a niche service so it would make minimal use of the 902-928 MHz spectrum and therefore cause minimal interference with unlicensed service in that band. That was the very essence of the service. It would be geographically isolated; for example, it would help track stolen cars and provide other vehicle monitoring service in places, such as outdoors in the middle of streets, where unlicensed devices, such as cordless phones, were unlikely to be harmed. It would be time limited; for example, it wouldn't be allowed to connect to the public switched network because that would encourage the continuous use of spectrum (e.g., for conversations) rather than the intermittent use of spectrum (e.g., to periodically send vehicular location information). It would also be demand limited; for example, compared to other licensed services, there just wasn't that much spectrum needed to meet the demand for vehicle location and monitoring data.

Let us now revisit three of Progeny's specific proposals, which are entertained once again in this NPRM.

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[47] *Ibid*., p. 43.
[48] *Ex Parte* Comments of Warren C. Havens, RM No. 10403, August 31, 2002, p. 13.
[49] *Supra* note 21, p. 5; *See also* Reply Comments of Ricochet, RM No. 10403, June 3, 2002, p. 1.

1) Elimination of the Restriction on Real-Time Interconnection

The FCC proposes to eliminate the restriction on real-time interconnection with the public switched network, including the Internet, for M-LMS licensees. The FCC's limitation on interconnection was based on the reason that direct connection to the network would result in much more licensed use of the band and thus unacceptable levels of interference with unlicensed use. As it states in its 1995 Report and Order:

> "We recognize the concerns of the Part 15 and amateur communities that the expansion of permissible uses of the LMS service will result in more intensive use of the 902-928 MHz band. Unfettered interconnection and messaging in the LMS could not only increase the potential for harmful interference to other users of the band, but detract from the intended purpose of the LMS allocation."[50]

The simple fact is that nothing has changed in the intervening years to change this reality. As Ricochet Networks observed:

> "The Commission has addressed and re-addressed Progeny's request to eliminate the restriction on real-time interconnection with the public switched telephone network (PSTN)…. Each time, the Commission has concluded correctly that, without such a restriction, LMS licensees would create unacceptable congestion in the 902-928 MHz spectrum." [51]

Systems with real time interconnection are also subject to interference from the primary Government Radiolocation systems in this band such as the Navy AN/SPS-49 radar which uses this band when it is in port, on major rivers, or near the coast.

Figure 1. AN/SPS-49 radar antenna

[50] FCC Docket 93-61 at ¶23.
[51] Comments of Ricochet Networks, RM No. 10403, May 15, 2002, p. 6.

This ban on real time interconnection has thus avoided conflict between the secondary M-LMS users and the primary military users, since systems without real time interconnection can cope easily with intermittent pulse interference from rotating radar systems. According to a Navy website,[52] the AN/SPS-49 is currently used on a variety of ships

- aircraft carriers: SPS-49(V)5 NIMITZ (CVN 68) class, SPS-49(V)5 JOHN F. KENNEDY (CV 67), SPS-49(V)5 KITTY HAWK (CV 63) class, SPS-49(V)5 ENTERPRISE (CVN 65)
- cruisers: SPS-49(V)6 TICONDEROGA (CG 47) class
- destroyers: SPS-49(V)2 SPRUANCE (DD 963) class (DD 997 only)
- frigates: SPS-49(V)5 OLIVER HAZARD PERRY (FFG 7) class
- helicopter carriers: SPS-49(V)5 WASP (LHD
- amphibious ships: SPS-49(V) WHIDBEY ISLAND (LSD 41) class. The similar AN/SPS-49(V)5 is used on LEAHY (CG 16), BELKNAP (CG 26), and KIDD (DDG 993) classes.

2) Elimination of the LMS spectrum cap

The FCC proposes to eliminate the spectrum cap for M-LMS licensees. This would allow Progeny or any other M-LMS licensee to buy out the other M-LMS operators and aggregate 14 MHz in each market. The result is that M-LMS operators, which operate at high power and can thus cause massive interference to unlicensed devices, could more efficiently provide higher-bandwidth services such as voice and broadband Internet service. However, these were exactly the types of services that the FCC didn't want M-LMS to provide because it recognized they would conflict with unlicensed service. The License Exempt Alliance and Ricochet explain this reasoning from the point of view of an unlicensed device using modern spread spectrum technology.

> **License Exempt Alliance**: "Progeny does not address the fact that the current LMS spectrum cap permits Part 15 operators to avoid interference to an LMS operator by deploying systems on channels not occupied by that operator. Permitting a single LMS operator to occupy the entire 902-928 MHz band would eliminate this option and thus put existing and potential Part 15 operations at risk."[53]
>
> **Ricochet:** "Ricochet deploys frequency hopping technology in the 900 MHz band in order to communicate from its Pole Top Radios to the end user modems. The Network is designed so that it will both "hop" out of any interference it may cause to others as well as to avoid interference by other operators in the spectrum. To the extent that one operator can dominate the entire band, there is less of an opportunity to avoid such interference."[54]

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[52] *See* https://wrc.navair-rdte.navy.mil/warfighter_enc/weapons/SensElec/RADAR/ansps49.htm.
[53] Comments of License-Exempt Alliance, RM No. 10403, May 15, 2002, p.4.
[54] *Supra* note 45, p. 16.

3) Elimination of the safe harbor restriction

The FCC tentatively proposes to reject Progeny's request to eliminate the safe harbor for unlicensed devices. NAF, *et al*. applauds the FCC's acknowledgment of the significant harm to unlicensed service that would come from eliminating the safe harbor. In its 1995 Report & Order, the FCC explained its reasoning for creating a Safe Harbor.

> "[The safe harbor] will promote effective use of the 902-928 MHz band by the various services by clearly establishing the parameters under which … unlicensed users of Part 15 devices may operate without risk of being considered sources of harmful interference to services with a higher allocation status. Part 15… operators who voluntarily operate within [the parameters of Section 90.361] will not be subject to harmful interference complaints from multilateration LMS systems at 902-928 MHz."[55] (cited on p. 12 of Ricochet comments)

In other words, without the safe harbor provision, LMS operators will have the right to endlessly litigate Part 15 device users and, a result of the ensuing investment uncertainty, effectively shut down unlicensed devices within the band. The FCC received substantial feedback to this effect in the comments leading up to the 1995 Report and Order and they were reiterated once again in the comments generated from Progeny's Petition. FreeWave Technologies explained the M-LMS licensees' incentives clearly: "Under Progeny's proposal," an LMS licensee "would have a huge financial incentive to install a radio network, allege interference, shut down or severely restrict the Part 15 users, and then offer its radio network as an alternative."[56] The License-Exempt Alliance and Ricochet explain the impact such incentives would have manufacturers of unlicensed equipment:

> **License-Exempt Alliance:** "Progeny takes no notice of the fact that the Commission has already reconsidered the "safe harbor" rule on two separate occasions and in both cases reaffirmed its previous findings as to the legality and public interest benefits of the rule….[N]or does it take any account of the harm that an elimination or weakening of the rule would inflict on Part 15 equipment manufacturers and service providers who have designed equipment and deployed service in reliance on the protection the rule provides."[57]

> **Ricochet**: "Progeny, in its Petition, requests that the Commission should once again entertain eliminating [the Safe Harbor] provision solely to provide it the "assurance" that it needs to attract investors—irrespective of the effect of the elimination of the rule on the billions of dollars of invested capital by Part 15 unlicensed users. Just as the Commission has ruled time and time again… granting Progeny's petition to eliminate the safe harbor provisions would eliminate the certainty that has resulted in the flourishing activity and competition brought by the Part 15 operators."[58]

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[55] *Ibid*., May 15, 2002, p. 12 (citation).
[56] *Ex Parte* Comments of FreeWave Technologies, RM No. 10403, February 24, 2003, p. 3.
[57] *Supra* note 47, p. 3.
[58] *Supra* note 45, p. 14.

SchlumbergerSema explains that elimination of the safe harbor could also result in a significant administrative burden placed on the FCC as it would be called in to resolve significantly greater inference complaints:

> "[T]he most likely consequence of liberalizing the rules for LMS to allow licensees to provide just another CMRS type offering is not the expanded use of the band, but rather the creation of an enormous regulatory and administrative burden on the agency in sorting out what would almost certainly be a myriad of interference complaints from existing Part 15 systems."[59]

M-LMS licenses have strong economic incentives to perpetually lobby for more government spectrum handouts

M-LMS licenses spent a total of $3.4 million for their licenses. What has been their potential payoff for successfully lobbying for complete spectrum flexibility on the 14 MHz of the 26 MHz of spectrum to which they have rights?

At the time of the M-LMS auctions in 1999 and 2001, licenses to use prime low-frequency spectrum such as the 900 MHz band were selling for approximately $1.1 billion/MHz.[60] That figure was derived from a number of 3G auctions in Europe in the late 1990s as well as the 2001 NextWave spectrum re-auction, which had totals bids for $16.5 billion. Multiplying 14 MHz by $1.1 billion generates a potential valuation of approximately $15 billion. That's a number that a potential M-LMS spectrum speculator in 1999 and 2001 would surely have been cognizant of.

After the dot.com boom, the value of spectrum dropped. Today, the going rate for prime spectrum is about $500 million/MHz. For example, that's the figure the FCC used to value the 10 MHz of spectrum acquired by Nextel in the 1900 MHz band. Using this figure gets us to a potential valuation of $7 billion for the 14 MHz of M-LMS spectrum under conditions of complete spectrum flexibility for M-LMS licensees.

In other words, M-LMS spectrum speculators can today hope for a windfall of approximately $7 billion—or more than a thousand times their collective investment—by squeezing out unlicensed spectrum and securing complete spectrum flexibility. This is down by more than 50% since the time the M-LMS licensees were originally auctioned, but it's still a breathtaking number.

Given human nature, these are extremely powerful incentives and can correspondingly be expected to generate predictable behavior: the endless quest for more spectrum flexibility at the expense of unlicensed service.

From the perspective of a M-LMS licensee, it doesn't matter if their original M-LMS business plan failed. It doesn't matter that they have no current rights to "spectrum

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[59] Comments of SchlumbergerSema, RM No. 10403, May 15, 2002, p. 7.
[60] *See* J.H. Snider, *Explanation to Citizen's Guide to the Airwaves*, New America Foundation, 2003.

flexibility." It doesn't matter that the only way they can win their windfall is at the expense of unlicensed services. All that matters is that as long as spectrum speculation is a rational course of action for them, they will continue to engage in it.

What are the odds that a spectrum speculator could actually secure such spectrum windfalls? Surprisingly good. During the 1980s, the FCC actually conducted lotteries to give away such windfalls. Doctors, dentists, lawyers, and other high-income individuals filed tens of thousands of applications to win lotteries for mobile spectrum. The winners often received returns of hundreds or thousands of times the amount they initially invested.

Perhaps the most widely used tactic in recent years has been to buy encumbered spectrum and then lobby the FCC for spectrum flexibility. Morgan O'Brien, who founded Nextel, is perhaps the most famous person to use this tactic. He purchased dispatch licenses that had minimal value and then got the FCC to grant him spectrum flexibility, turning straw into gold and providing Nextel's investors with billions of dollars in profits. An obvious question is whether this isn't also the motive behind the M-LMS speculators.

Multi-billion dollar spectrum windfalls have also been achieved by other means. In the mid-1990s, for example, Nextwave bid $4.7 billion for spectrum to be used for mobile services. But it had a major problem: it didn't have the money to pay for the licenses. It subsequently went bankrupt and the FCC, as noted before, reauctioned the spectrum for $16.5 billion. But the U.S. Supreme Court ruled that the FCC didn't have the authority to reclaim Nextwave's licenses, even if they had defaulted. So the result was that Nextwave was ultimately able to resell the licenses itself and capture the resulting windfall of billions of dollars. Nextwave created nothing of value for American consumers—only windfall profits picked from the pockets of American taxpayers.

The Nextwave spectrum speculation is especially noteworthy because Janice Obuchowski, lead lobbyist for Progeny, was the vice chair of Nextwave. Progeny, in other words, is not just a typical spectrum speculator. The company's name may be obscure but the team behind it includes seasoned all-stars in the great D.C. game of spectrum speculation.

Evidence that M-LMS licensees have been motivated at least in part by spectrum speculation is the fact that the two largest M-LMS licenses have devoted large resources to seeking spectrum flexibility, possibly far more than actually building out their network. They also have not built out their networks as promised and have demonstrated no financial capacity to do so. Indeed, most of them appear to be shoestring operations. Moreover, like many of the spectrum lottery winners of the 1980s, their stated ambitions conflict with their means. Building out and marketing a flexible use network in competition with mobile telephone and other flexible use incumbents would be far more expensive than building out and marketing the niche network initially promised. The incumbent licensees would clearly have to sell their licenses to a bigger, deep pocketed operator.

Again, the Nextwave story is relevant. To avoid the charge of being speculators "trafficking" in spectrum, the founders of Nextwave for close to a decade publicly insisted to the FCC and the press that their purpose in acquiring licenses was to build out the network themselves rather than flip the licenses for a profit to a big incumbent mobile carrier. But, in the end, that's exactly what they did with the great majority of their spectrum rights.

M-LMS Licensees' Perpetual Lobbying for More Spectrum Rights Creates Harmful Investment Uncertainty for Unlicensed Manufacturers and Users, Undermining U.S. Broadband Deployment and Innovation

Of course, nobody can definitively prove that M-LMS licensees are fundamentally spectrum speculators. As GE- Internlogix frames the alternatives:

> "The auction for LMS spectrum was held in 1999. And even in the world of rapid technological development, little has changed since 1999. When Progeny bid for its spectrum, it knew or must have known that a competitive technology, GPS, had been released for civilian use years before and was not only widely available, but already a popular option in automobiles. And Progeny certainly knew about the coming requirements for E911 capability. Either Progeny made a bad business judgment and now expects the FCC to save its investment, or Progeny knew when it bid that prospects for the LMS service had already dimmed, but chose to proceed on the theory that it could subsequently convince the Commission to change its rules."[61]

Regardless of Progeny's true motives, all that is necessary for unlicensed manufacturers and users to be harmed is for a reasonable expectation to be created that M-LMS licensees will continue to take actions consistent with the spectrum speculation hypothesis and that these actions will have a probability greater than zero of success.

This is the type of investment uncertainty the FCC, incumbent lobbyists, and Wall Street have talked about so frequently in various contexts affecting licensees. The point here is that it can also harm unlicensed manufacturers and users. Progeny itself uses the argument to justify its failure to secure M-LMS equipment because of a "chilled equipment market" stemming from "uncertainty over future rules."[62]

As the record indicates, the FCC has revisited the same service rules limiting M-LMS again and again since the 1980s, each time confirming that M-LMS should not come at the expense of unlicensed service. But like the Terminator, it appears that the same battles must be fought again and again. No matter what the earlier FCCs have decided, the M-LMS lobbyists will come back again and again and again with the same requests seeking more spectrum flexibility. Presumably, if they ask enough times, they will

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[61] *Supra* note 21, p. 3.
[62] Request for Waiver in the matter of Progeny LMS, LLC, February 15, 2005, p. 15.

eventually find a weak spot in the Commission and get what they want. The result is that a permanent pall of fear has been cast over unlicensed manufacturers and users in this band. This is tempered by the fact that manufacturers and users who want access to low-frequency unlicensed spectrum such as the 902-928 MHz band have practically no other options. But this type of uncertainty is still undesirable.

In short, as the FCC considers granting any of the M-LMS industry's requests for spectrum flexibility, it must consider two types of harms to unlicensed service: 1) the direct harm from the actual increase in harmful interference, and 2) the expectations it will create among unlicensed manufacturers and users that they are at increased risk of losing their investments in this band. At the very least, the FCC should consider that virtually every unlicensed manufacturer that filed in response to Progeny's Petition argued that merely issuing the NPRM would create harmful investment uncertainty for their business.

Public Policy Recommendations

NAF, *et al*. recommends two general courses of action for the FCC: 1) it should not expand the rights of M-LMS licensees, and 2) it should let M-LMS licenses expire at the end of their legal terms. Although the NPRM does not acknowledge this reality, these two courses of action are actually integrally related. If M-LMS is a failed business model, then maintaining the status quo is not really an option for the FCC. It must either dramatically expand the rights of M-LMS licensees at the expense of unlicensed service, or it must terminate the M-LMS licenses, at least several of which have already missed their FCC required construction deadlines.

M-LMS Licensees Should Not Be Granted New Spectrum Rights at the Expense of Unlicensed Service

The NPRM states as a foundational principle for this rulemaking that M-LMS licensees won't be granted additional spectrum rights at the expense of unlicensed users. This, in fact, is a congressional mandate: As CTIA observed, "Congress has directed the Commission not to allocate spectrum to provide 'flexibility of use' if such flexibility would "result in harmful interference among users."[63] But there is enough hedging language thrown into this NPRM that NAF, *et al*. is worried about the FCC's actual intent.

Progeny's Petition and some of the language in the NPRM suggests that expanding Progeny's spectrum rights is a response to marketplace demands. But nothing could be further from the truth. As we have seen, Progeny acquired a license that resulted in a failed business. The government is under no obligation now to bail out Progeny and the other M-LMS licensees. Many commentators already made this point in response to Progeny's plea for a bailout, and we repeat their arguments here.

[63] Comments of CTIA, RM No. 10403, June 3, 2002, p. 5.

WaveRider: "It must… be emphasized that Progeny and other Location and Monitoring Service ("LMS") licensees bought their spectrum with full knowledge that (1) Part 15 operations were permitted in the 902-928 MHz band and (2) the Commission had adopted a "safe harbor" rule for the 902-928 MHz band to clarify what constitutes "harmful interference" from Part 15 devices. All said, Progeny's rulemaking proposal is little more than a transparent attempt to shift the blame for Progeny's shipwrecked business model to the license-exempt community."[64]

Itron: "Progeny has overlooked a critical fact. Although the Commission is striving for increased spectrum flexibility, it does not pursue flexibility at the expense of interference protection. Progeny cites to cases in which the Commission liberalized service rules to enhance flexibility, but in none of those cases did the Commission abandon its interference objectives. In fact, in the very statutory provision that Progeny relies upon, Congress has directed the Commission not to allocate spectrum to provide "flexibility of use" if such flexibility would "result in harmful interference among users."[65]

CTIA: "Progeny's petition suggests that LMS may not be a viable service. If this is the case, the existing allocation for LMS should be revisited, and the Commission should consider whether reallocation of the LMS spectrum is preferable to grant of the requested flexibility."[66]

Ricochet Networks: "The price Progeny paid for its license was a reflection of the restrictions placed upon the license by the very rules that Progeny seeks to eliminate through its Petition….. It therefore seeks to convert the restricted license it purchased for a fair market value into a much more valuable unrestricted license—to the detriment of the public interest."[67]

SchlumbergerSema: "It is not the Commission's job to guarantee the success of any business venture."[68]

IEEE 802.18 Standards Group: The LMS licensees' requests "represent an unabashed attempt to rewrite the long-established LMS rules… for the purpose of advancing their own financial interests under the guise of Public Safety and Critical Infrastructure improvements…. We oppose the[ir] blatant attempts… to realize a windfall and further their narrow financial interests at the expense of other users of the 902-928 MHz band."[69]

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[64] *Ex Parte* Comments of WaveRider, RM No. 10403, p. 4.
[65] Comments of Itron, RM No. 10403, May 15, 2002, p. 4.
[66] *Supra* note 57, p. 2.
[67] Comments of Ricochet Networks, RM No. 10403, May 15, 2002, p.18.
[68] Comments of SchlumbergerSema, RM No. 10403, May 15, 2002, p. 6.
[69] *Ex Parte* Comments of 802.18 Standards Body, RM No. 10403, September 29, 2002.

Progeny also observes that the Spectrum Policy Task Force sought to promote "greater market innovation." It infers from this that licensed service like M-LMS should be preferred to unlicensed service. But nowhere is the logic of its argument explained. In fact, a good argument can be made that unlicensed use, not licensed use, favors greater market innovation. For example, as the list of authorizations in the 902-928 MHz band reveals, unlicensed service has spawned infinitely more innovation and diversity of products in the 902-928 MHz bands than M-LMS service. Indeed, an earlier study by NAF found that even when the rates of innovation between unlicensed and CMRS services were compared, unlicensed came out ahead in recent years by a factor of 25:1. That is, more than 25 times the number of unlicensed than CMRS devices were authorized in an unlicensed band of spectrum less than half the size of the CMRS bands.[70]

This NPRM Should be Swiftly Terminated Because it is Creating Harmful Uncertainty for Unlicensed Manufacturers and Users

The FCC has on numerous occasions observed that regulatory uncertainty creates disincentives to use particular bands of spectrum. The incumbent M-LMS licensees' perpetual efforts to expand their spectrum rights at the expense of unlicensed service have created just this type of uncertainty. Fairness requires that the FCC's aversion to uncertainty should apply when the uncertainty applies to unlicensed as well as licensed investors, users, and service providers. Accordingly, to eliminate this present harm, the FCC should as soon as practicable reject the M-LMS licensees' efforts to expand their rights. Many commentators have already made this point:

> **American Public Power Association**: "Unfortunately, even issuing the NPRM will have a substantial adverse effect on the unlicensed utility user community. It will place a cloud of uncertainty over the continued unlicensed use of the 902-928 MHz band just when such use is becoming increasingly important as utilities and customers strive to become more efficient in the delivery and use of scarce resources. The development of unlicensed radio technologies, and the public's increasing reliance on them, has been one of the few bright spots in the telecommunications industry in recent years. Yet nothing will undermine this success more quickly than regulatory churn in unlicensed usage regulations."[71]
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> **WaveRider**: "[A]s observed by the Commission's Spectrum Policy Task Force, "a level of certainty regarding one's ability to continue to use spectrum, at least for some foreseeable period, is an essential prerequisite to investment and lead time."[72] Such uncertainty inevitably will result from a Notice of Proposed Rulemaking on Progeny's proposal, since it will raise doubts among equipment vendors, WISPs, subscribers and the financial community as to whether and to what extent the 902-928 MHz band will continue to be available for license-exempt broadband service."[73]

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[70] *See supra* note 12, p. 7.
[71] American Public Power Association, *Public Power Weekly*, August 6, 2003, p. 2.
[72] Report of the Spectrum Policy Task Force, ET Docket 02-135, p. 23.
[73] *Ex Parte* Comments of WaveRider, RM No. 10403, November 5, 2003.

The FCC should not grant M-LMS licensees extensions on their construction deadline.

Progeny, Warren Havens, and FRC make a number of arguments why their FCC mandated construction deadlines should be extended. But the crux of their argument relates to Section 19.946(e) of the FCC rules, which states that an extension of time may be granted if the licensee shows failure to complete construction is due to causes beyond its control. These licensees argue they made good faith efforts to acquire M-LMS equipment but were unable to acquire such equipment because manufacturers declined to provide it. Hence, forces beyond their control made them unable to fulfill their construction requirements.

The license and construction status of the five M-LMS operators that purchased licenses in the 1999 and 2001 LMS auctions are contained in Appendix C. Licensees were granted five years to build out at least a third of their service areas. Note that for three of the M-LMS licensees, the original construction deadline was in 2004. Progeny, Warren Havens, and FCR filed requests to extend the deadline for three years. The FCC granted the petitions for Warren Havens and FCR but the petition for Progeny is listed as "pending."

It's hard to evaluate Warren Havens' claims to have done due diligence because this information was filed confidentially with the FCC. We have no reason to believe that, unlike Progeny and FCR, Warren Havens didn't enter into some contract to have M-LMS equipment developed. But it is noteworthy that this confidential information was filed three years ago and there is no evidence that the hidden equipment plans have resulted in any useful M-LMS service for consumers. Consider also this promise from Warren Havens made in 2002 in response to Progeny's Petition for flexibility:

> "Whether or not there are changes approved by the FCC, we will move forward. We plan significant deployments. Our licenses cover most of the A block spectrum and that is 78% of the U.S. population."[74]

Havens cannot perpetually have it both ways. He cannot keep claiming year after year that he is actively constructing an M-LMS service while in fact providing no demonstrable service to the public.

NAF, *et al*. agrees with Mobex's filing opposing Warren Havens' extension request. Mobex argues that based on the public record, "Havens failed to demonstrate that he made a legitimate effort to obtain equipment."[75] Mobex also argues that "Haven's request is part of a pattern of delay in which he seeks to use his licenses in various bands for purposes other than those for which they are intended."[76]

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[74] Timothy Sanders, "Threats to 900 MHz Broadband Wireless," *Broadband Wireless Online,* November/December 2002.
[75] FCC Memorandum Opinion and Order, in the Matter of Request of Warren C. Havens for Waiver of Five-Year Construction Requirement for his Multilateration Location and Monitoring Service Economic Are Licenses, DA -04-3864, Released December 9, 2004 at ¶8.
[76] *Ibid*. at ¶11.

FCR's excuse for not entering into a contract for M-LMS equipment rests on the assumption that it only has 13 licenses and thus must rely on the equipment development efforts of the licensees with larger authorizations, like Progeny and Warren Havens. NAF, *et al*. agree with Warren Havens' critique of this legal reasoning:

> "The [FCR] Order is extreme and should be reversed. If allowed to stand, then any licensee is entitled to an extension by merely asserting that there is no equipment and that such licensee has no responsibility to undertake substantial due diligence to develop and obtain such equipment where there are other licensees who have more spectrum in the same radio service…. FCR had an obligation to pursue equipment development and did not…. FCR should not be allowed to be passive and not spend time and money developing equipment or using the spectrum, until a "large authorization holder", such as Petitioners, do so, and apparently, offer the results of this for free to Mr. Fox [the owner of the FCR licensees]…. By FCR's logic and the FCC grant of the request, FCR can perpetually hold its LMS licenses until a "large authorization holder" does something, however these same "large authorization holders" cannot do the same."[77]

Progeny's excuse for not finding equipment is that it made good faith efforts to find suitable equipment, but until the M-LMS rules are changed, no manufacturer will provide the equipment.

> "[T]he lack of available M-LMS equipment is due to causes beyond Progeny's control and exists despite the company's years of due diligence in working to procure equipment regarding these licenses…. As previously demonstrated by Progeny, the company has discussed equipment availability with a wide array of U.S. telecommunications suppliers, ranging from larger firms to smaller, entrepreneurial companies. The response was uniform. Manufacturers expressed their strong reluctance to invest the time and financial resources in developing equipment for a stand-alone location and monitoring service."[78]

Warren Havens strongly opposed this legal reasoning, and NAF, *et al*. again concur with him.

> "FCC licenses are not a mandate to construct or expend substantial funds and efforts to attempt to obtain or develop equipment to construct…. They are an option to do so, and upon failure the option automatically terminates at the construction deadline. Progeny stated to the Commission emphatically and repeatedly in the public RM-10403 proceeding (including in dozens of ex parte filings), with no change to this day—and thus also to all potentially capable equipment developers and providers, and end users, and operational partners—

[77] Petition for Reconsideration or Alternative Action in the Matter of Grant of Request for Extension of Five-Year Construction Requirement, DA 05-541, April 4, 2005, pp. 2, 4.
[78] Request for Waiver in the matter of Progeny LMS, LLC, February 15, 2005, p. 15.

> that M-LMS was a failure and would continue to fail…. Progeny had to spend money and make long term commitments to compel a company to develop then make and supply required M-LMS equipment and any additional permitted equipment. Its due diligence materials show that it entirely failed to do so…. Manufacturers are not going to just make equipment on their own for the LMS service without a licensee making a business and technical case."[79]

Perhaps because of such compelling arguments, the Commission has not granted Progeny's request for an extension and, close to two years after Progeny's construction deadline, merely marks the request for extension as "pending."

PCS Limited also acquired licenses in the 1999 auction, but its buildout date is later than the others M-LMS licensees because of special circumstances. Warren Havens filed a complaint against PCS Limited for violation of FCC bidding rules. PCS Limited received a 35% credit on its auction bids. But Warren Havens argued that it didn't properly fulfill the paperwork necessary to receive the credit. Specifically, PCS Limited didn't provide the necessary financial information about itself. Warren Havens argued that this not only violated FCC rules but was patently unfair because the bidding credits 1) allowed PCS Limited to bid more for the licenses than they otherwise would have been able to, 2) forced Warren Havens to pay more for some licenses than he otherwise would have, and 3) resulted in Warren Havens losing licenses he would otherwise have been able to acquire. As a result of these complaints, PCS Limited received its license some years late, so it has not had to file a request for a waiver of its construction deadline.

Lastly, Helen Wong-Armijo purchased her M-LMS licensees in 2001, so her buildout deadline is not until October 20, 2006. Her licenses appear to be overwhelmingly in smaller rural markets. Repeated calls to Helen Wong-Armijo's attorney resulted in a recorded message that the telephone line was disconnected. No other contact information is provided in the ULS for Ms. Wong-Armijo. PCS Limited thought she might be bankrupt and that this information might not show up in the ULS system.

NAF, *et al*. believes that the FCC has used faulty economic logic in determining what constitutes a good faith effort to acquire M-LMS equipment in this band. M-LMS licensees observe that manufacturers did not want to build equipment for M-LMS service. But basic economic theory within the field of industrial organization would suggest they would have been very stupid to do so. According to industrial organization theory, suppliers are in a very weak bargaining situation if their product has high asset specificity; that is, cannot be easily repurposed and sold to other buyers. When such an economic condition exists, the equilibrium position is vertical integration of the industry. That is, a company seeking to use a particular piece of equipment will have to either finance its development or develop it internally. The key to the analysis is to start by looking at the world from the perspective of the supplier. It would be economic folly for a supplier to invest its own risk capital in developing a product for a market characterized

[79] Reply to Response to Opposition, Erratum Version, In the Matter of Progeny LMS, LLC Waiver Requests for Extension of the M-LMS Five-year Construction Requirement, File No. 0002049041, December 13, 2005, pp. 3,7,8,11.

by asset specificity, so the supplier will NEVER independently develop such a product. An astute buyer, recognizing this market situation, will never invest his own risk capital in a product unless he can finance the risk capital for all the product parts characterized by a high degree of asset specificity.

The M-LMS service was marked by high asset specificity. By design, M-LMS was a niche product; it was designed to be unique. There were only two potential major buyers. Hence, for the reasons explained above, it would have been crazy for a supplier to develop M-LMS equipment. Thus, any reasonable business plan for M-LMS would have had to include funds to develop the necessary equipment. There is no indication from the filings of Progeny that its business plan included such expectations.

As a point of comparison, observe that with other spectrum services with very few buyers and highly specialized equipment, successful business plans include financing the early development of equipment. DBS, for example, had only two major operators and specialized equipment. The DBS companies solved the resulting incentive problem by putting in their own orders for equipment.

In short, it defies economic logic for the FCC to assume that a good faith effort by M-LMS licensees to acquire M-LMS equipment could consist in the M-LMS operator going around asking manufacturers to risk their own capital developing M-LMS equipment. But an even more fundamental point is that if M-LMS is not a viable business, as Progeny has repeatedly argued, then it can never be built out in more than a superficial way. Under such circumstances, to argue that construction deadlines should be extended is merely to pretend that what will not happen—and should not happen for reasons already laid out in this NPRM—will in fact happen.

The FCC should terminate M-LMS licenses regardless of buildout

The FCC really has only two viable long-term options before it: 1) terminate the M-LMS allocation, or 2) significantly expand it. For reasons already argued in these comments, NAF, *et al*. does not believe it is desirable or even legal for the FCC to significantly expand those rights. So that leaves the option of terminating them. Specifically, NAF, *et al*. proposes that the FCC allow M-LMS licenses to expire at the end of their terms.

Obviously, it is unusual for the FCC not to renew licenses at the end of their terms. But the reason that licenses have fixed duration is exactly so that the FCC has the ability to exercise such an option. And if there ever was a case to exercise such an option, this is it. M-LMS is a failed business model and the only thing sustaining the desperate M-LMS licensees is the hope that the FCC will grant them a spectrum rights windfall, something the FCC is under no obligation to do.

Allowing M-LMS licensees to continue to keep their licenses will also send terrible a signal to manufacturers and users of unlicensed equipment. That message is that the failures of licensed services will not be penalized but the successes of unlicensed will. That is, heads you lose; tales I win. The message will be especially harmful in the 900

MHz band because sophisticated unlicensed manufacturers and users know that the efforts of incumbent licensees to expand their flexibility are eternal. It doesn't matter if this NPRM grants the incumbents no additional rights, a modest increase, or a dramatic increase. It's like having a wild lion cub in the house. He may seem as innocent as a house cat but you know that sooner or later he is going to bite—and with a high probability of a very harmful outcome.

Lastly, NAF, *et al*. wants to call attention to the two grandfathered M-LMS licensees, which got their licenses before the M-LMS auction era began in the late 1990s. The NPRM only mentions these licenses incidentally: "Only two M-LMS licensees, Teletrac and Ituran, operate M-LMS systems, and these exist in only a small number of markets. These two licensees were grandfathered when the LMS rules were adopted, and neither of them acquired geographic licenses in Auction 21 or Auction 39." In a footnote, it adds the following information: "Teletrac operates networks in Chicago, Dallas, Detroit, Houston, Los Angeles and San Diego. Ituran operates a network in parts of Florida."

These grandfathered M-LMS operators came up in the non-grandfathered M-LMS licensees' petitions to win extensions on their construction deadlines. The argument presented by both Warren Havens and FCR was that, in fact, no M-LMS service was being provided by these companies, which is one of the major reasons the non-grandfathered M-LMS licensees couldn't fulfill their construction requirements. Warren Havens states:

> "Prior to the auction of LMS-M EA-based licenses, including the Licenses, one company, Teletrac, acquired and operated first-generation LMS-M equipment provided by an equipment supplier, Tadiran. No other company has produced equipment for commercial LMS-M stations. This equipment provided basic location and associated short "status" messaging. Havens investigated this equipment soon after the auction of LMS-M licenses in early 1999; however, it was no longer commercially available."[80]

FCR's request to extend its deadline similarly explained away the theoretical existence of grandfathered M-LMS equipment:

> "FCR has been working ever since the auction (21) to start a viable LMS system. It was aware of the grandfathered operations in Miami and elsewhere using equipment supplied by Tadiran. It was also aware of the operations of Tadiran in Israel providing multilateration location monitoring services. In fact, Tadiran's equipment was developed to meet Israeli standards, not US LMS standards. What FCR did not know was that Tadiran was the only provider of equipment for this service and that the equipment had significant limitations at that time, including problems operating in an urban environment, and that the system was operated with various degrees of inaccuracy that made it commercially non-viable. It apparently never operated with anything close to the reliability and accuracy of

[80] Request for Partial Waiver (Waiver of the Five-Year Construction Benchmark) in the matter of Licenses of Warren C. Havens in the Location and Monitoring Service, WPOJ876, December 13, 2003, p. 3.

> GPS. FCR met with a representative of Tadiran and thoroughly explored the functioning of the system and it was during that meeting that the limitations became apparent. FCR was advised that the manufacturer was attempting to refine the product. Since then, to the best of FCR's knowledge, the provider has ceased production and operation of the LMS-like system in Israel."[81]

These passages raise certain discrepancies with the text in the NPRM. First, FCR seems to attribute the Florida operations to Teletrac, not Ituran. Second, and more important, the M-LMS licensees make it appear that the 900 MHz LMS services of the two grandfathered incumbents are essentially defunct. The NPRM's account of the two licensees contains no such implication. It is, of course, possible that the two licensees have some remnant LMS service. But it is hard to imagine how valuable a business it could be if no new equipment for users has been on the market since 1999. Consider what type of cell phone handsets were on the market in 1999 and what percent of current used handsets (probably well under .1%) are from 1999 or before. Indeed, most handsets don't even last two years, let alone seven.

Another discrepancy involves the two vendors' websites. Both Teletrac and Ituran appear to be large, successful companies that provide location information services throughout the world. Let's take Teletrac, a U.K-based company. Its online literature overwhelmingly touts the wonders of its GPS-based location information systems. Although GPS-based end user equipment is also featured, it does show a Vehicle Locator Unit that operates in the 902-928 MHz band. Ituran, an Israeli-based company that was originally a subsidiary of Tadiran, claims to provide vehicle information service to all five major continents on the earth. No where on its website does it specifically mention a 902-928 MHz-based service.

Neither Teletrac nor Ituran filed in response to Progeny's Petition. NAF, *et al*. also doesn't know the actual status of Teletrac's and Ituran's 902-928 MHz M-LMS operations. But their existence raises several questions: First, if the non-grandfathered M-LMS licensees were wrong that there was no M-LMS equipment commercially available, then the FCC should not have accepted their petitions to extend their construction deadlines on the grounds it did. Second, if the incumbents' M-LMS operations are defunct as the non-grandfathered M-LMS licensees claim, then the FCC should take back those grandfathered M-LMS licenses at the end of their lease terms.

In any case, none of the parties who have commented on M-LMS service appears to disagree that the grandfathered M-LMS licensees only have rights to provide an obsolete service. In such a situation, whether or not a rump 900 MHz M-LMS service continues to exist, the FCC should reclaim the spectrum involved for more productive services.

The FCC's command and control allocation system occasionally leads to the type of mistakes manifested in the M-LMS allocation. But the solution to every such mistake is not to grant licensees with the faulty business plans a spectrum windfall. The alternative

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[81] FCR Petition for Reconsideration or Alternative Action in the Matter of Grant of Request for Extension of five-year construction requirement, April 4, 2005, Exhibit 1, pp. 1-2.

is for the FCC simply to admit it made a mistake and reverse it by taking away the license that should never have been granted in the first place. This is what the FCC should do in this case. Moreover, in this particular case, the FCC cannot simply grant the incumbents M-LMS operators full geographic area spectrum flexibility because it knows that would result in blatant, extremely destructive interference to unlicensed service. So its choice is either to continue to pursue the failed command and control M-LMS allocation in the M-LMS band, or abandon it for the type of unlicensed service that the FCC's Spectrum Policy Task Force lauded as an alternative to command and control regulation.

The time has come for the FCC to send a clear and unmistakable signal to potential spectrum investors and current licensees: spectrum speculators will not be tolerated. The FCC is not in the corporate welfare business. It will not bail out failed businesses with government subsidies. Nor will it heel to even the wealthiest and best politically connected spectrum lobbyists. They must pay their fair share and stand in line like every other citizen of the U.S. It is sad that many of the M-LMS licensees have now become desperate and will most probably lose their investments without a bailout from the FCC. But the FCC is under no more obligation to bail them out than the hundreds of thousands of Americans who every year gamble on the slot machines in Las Vegas and come out losers.

900 MHz safe harbor rules for unlicensed devices should allow more power at greater heights in sparsely populated areas.

If M-LMS interference rights were removed from the 902-928 MHz band, new opportunities to expand unlicensed service would be created. One possibility worth investigating would be to increase unlicensed device power levels in sparsely populated rural areas. In various proceedings the FCC has already proposed increasing power levels for wireless devices in sparsely populated rural areas.[82] The same principle could now be applied to this band. In places like rural Wyoming or in the middle of the Great Lakes, there is no reason unlicensed devices cannot operate at higher power levels.

The FCC might also want to revisit its restrictions on outdoor unlicensed use in the 902-928 MHz band. When the original service rules were developed, municipal networks using unlicensed spectrum in an outdoors environment were not even conceived. The vast majority of unlicensed services, such as cordless phones and baby monitors, were primarily indoors. With M-LMS no longer using up the outdoor space that was expected to be its service area, new possibilities may be opened for unlicensed to use those spaces.

If M-LMS rules are changed to increase their scope of service, the proponents should be expected to show that they can provide the new service even if strong signals from primary Federal Government radiolocation systems are present

It is unambiguous that M-LMS is a secondary service in this band. Dramatically increasing M-LMS usage of the 902-928 MHz band risks causing interference with

[82] E.g., 3650-3700 MHz proceeding (ET Docket 04-151).

signals from Navy radars. FCC and NTIA can expect continuing headaches in this area unless any new systems are designed to operate in the presence of Navy radar signals. The Commission should expect a showing from the M-LMS proponents that such sharing is at least plausible and should be unambiguous in its rules and its other regulatory documents about the secondary nature of this allocation.

Conclusion

In the 902-928 MHz band, M-LMS is a failed service while unlicensed is a thriving service. Making a success out of M-LMS can only be done by turning M-LMS from a niche to a general purpose service. This, in turn, can only be done at the expense of future unlicensed service. But the FCC is under no obligation to do this and should not do it.

In all other contexts, a lessor has the rights to: 1) terminate a lease when its terms are violated, and 2) not renew it once it expires. This also applies when the lessee is an M-LMS licensees and the lessor is the FCC. When an M-LMS licensee violates its lease terms, the FCC has the right to terminate the lease, and should do so in this case. Similarly, when the lease of an M-LMS licensee has expired and does not fulfill its stated public purpose, the FCC has the right not to renew it, and should not renew it in this case.

The machinations of the M-LMS licensees in this band have become an embarrassing soap opera at best and a disgraceful Machiavellian grab of public resources at worst. Lest the FCC be tarnished by all this dirt, it should swiftly bring the M-LMS saga to its end. Doing so will give the 902-928 MHz unlicensed manufacturers and users the green light they deserve to continue their extraordinary growth and innovation within this band.

Appendices

Appendix A: Commenting Parties

Acorn Active Media Foundation engages in software, website and technical development in support of the global social and economic justice movement. www.acornactivemedia.com

The mission of the **Alliance for Community Media** (ACM) is to advance democratic ideals by ensuring that people have access to electronic media and by promoting effective communication through community uses of media. www.alliancecm.org

The **Center for Digital Democracy** (CDD) is committed to preserving the openness and diversity of the Internet in the broadband era, and to realizing the full potential of digital communications through the development and encouragement of noncommercial, public interest programming. www.democraticmedia.org/index.html

The **Champaign-Urbana Community Wireless Network** (CUWiN), a project of the Urbana-Champaign Independent Media Center Foundation, has deployed an extensive mesh network using Part 15 spectrum in the Champaign-Urbana metro area. The three-part mission is to (a) connect more people to Internet and broadband services; (b) develop open-source hardware and software for use by wireless projects world-wide; and, (c) build and support community-owned, not-for-profit broadband networks in cities and towns around the globe. www.cuwireless.net

Common Cause is a non-partisan non-profit dedicated to holding power accountable and encouraging citizen participation in democracy. Common Cause has nearly 300,000 members and supporters throughout the country, and state organizations in 38 states. www.commoncause.org

Consumer Federation of America (CFA) is the nation's largest consumer advocacy group, composed of two hundred and eighty state and local affiliates representing consumer, senior citizen, low-income, labor, farm, public power and cooperative organizations, with more than 50 million individual members. www.consumerfed.org

FreeNetworks.org is a volunteer cooperative association dedicated to education, collaboration, and advocacy for the creation of FreeNetworks. A FreeNetwork is any computer network that allows free local transit. FreeNetworkers have been meeting since 2000 to organize, share information, and pool resources to find the best way to build community networks. Our members include community advocates, system administrators, RF engineers, writers, lawyers, programmers, business owners, and many others who want to help build FreeNetworks in their local communities. www.freenetworks.org

Free Press is a national nonpartisan organization working to increase informed public participation in crucial media policy debates, and to generate policies that will produce a more competitive and public interest-oriented media system with a strong nonprofit and noncommercial sector. www.freepress.net

Media Access Project (MAP) is a 30 year-old non-profit tax exempt public interest telecommunications law firm which promotes the public's First Amendment right to hear and be heard on the electronic media of today and tomorrow. MAP's work is in the courts, the FCC, and in active outreach as a coalition builder among other public interest organizations. MAP is the only Washington-based organization devoted to representing listeners' and speakers' interests in electronic media and telecommunications issues before the Federal Communications Commission, other policy-making bodies, and in the courts. www.mediaaccess.org (*Counsel for NAF, et al.*)

National Hispanic Media Coalition (NHMC) is a coalition of Hispanic-American organizations that have joined together to address a variety of media related issues that affect the Hispanic-American community across the nation. www.nhmc.org

New America Foundation (NAF) is a nonpartisan, non-profit public policy institute based in Washington, DC, which, through its Wireless Future Program, studies and advocates reforms to improve our nation's management of publicly-owned assets, particularly the public airwaves. www.newamerica.net

Prometheus Radio Project is a Philadelphia-based unincorporated collective of radio activists committed to expanding opportunities for the public to build, operate and hear low power FM radio stations. www.prometheusradio.org

Public Knowledge is a group of lawyers, technologists, lobbyists, academics, volunteers and activists dedicated to fortifying and defending a vibrant information commons. www.publicknowledge.org

Appendix B: Summary of LMS Licensees

Licensee	Total LMS Licenses		Gross Cost of Winning Bids	Bidding Credit	Actual Amount Paid
	#	%			
Post-Auction Era (1999 and 2001 LMS auctions)					
Progeny LMS, LLC	228	47.8	$3,623,162.00	35%	$2,355,056.00
Warren C. Havens/Telesaurus Holdings GB *	95	19.92	$1,385,961	35%	$900,878
Helen Wong-Armijo **	84	17.61	$89,800	35%	$58,370
PCS Partners, L.P.	32	6.709	$813,600	35%	$528,840
FCR, Inc.*	13	2.725	$153,454	35%	$99,745
Pre-Auction Era (grandfathered Automatic Vehicle Monitoring licenses)					
Teletrac License, Inc.***	21	4.403	N/A	N/A	N/A
Ituran License Corp.***	4	0.839	N/A	N/A	N/A
TOTAL	477	100	$6,065,977.00		$3,942,889.00

* Havens/Telesaurus and FCR purchased LMS licenses at 2 separate FCC auctions - Auction 21 in 1999 and Auction 39 in 2001

** It is not known if this licensee is still in business. Calls to the contact number provided in the FCC's Licensing Database revealed a disconnected number.

*** According to the NPRM at page 6, Teletrac operates networks in Chicago, Dallas, Detroit, Houston, Los Angeles and San Diego, and Ituran operates a network in parts of Florida.

Sources: FCC Universal Licensing Database (ULS), FCC Auction 21 Bidder Data (http://wireless.fcc.gov/auctions/21/charts/21cls1.pdf), FCC Auction 39 Bidder Data (http://wireless.fcc.gov/auctions/39/charts/39cls1.pdf), Letter from Amy Zoslov of FCC Wireless Telecommunications Bureau to Eric W. DeSilva of Wiley, Rein & Fielding regarding Progeny LMS, LLC default payment obligations and procedures, August 30, 1999

Table compiled by Naveen Lakshmipathy

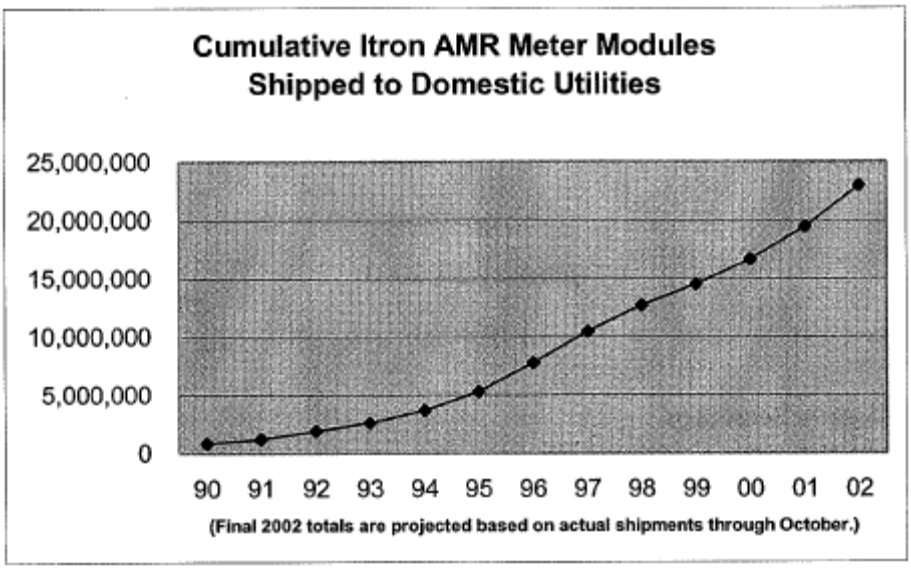
Appendix C: Timeline of LMS Licenses and Buildout Deadline Extensions

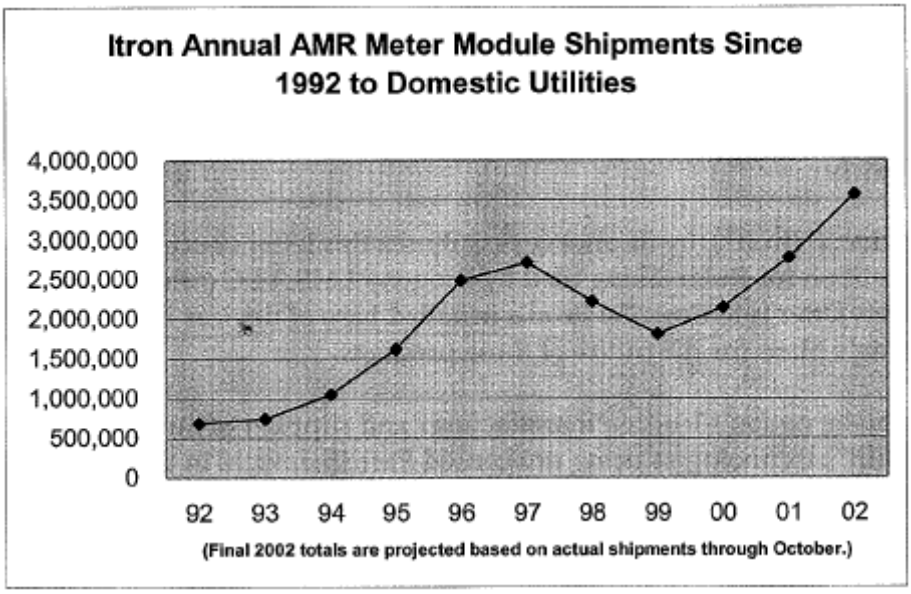
LMS Bidder Name	Auction #	Total LMS Licenses	License Grant Date	License Effective Date	License Expiration Date	Buildout Deadline 1			Buildout Deadline 2
						Original	Extension Request	New Deadline	
Progeny LMS, LLC	Auction 21	228	7/19/2000	2/16/2005	7/19/2010	7/19/2005	Pending		7/19/2010
Warren C. Havens/Telesaurus Holdings GB	Auction 21	52	7/14/1999	2/27/2006	7/14/2009	7/14/2004	Granted	7/14/2007	7/14/2009
	Auction 39	43	10/5/2001	10/5/2001	10/5/2011	10/5/2006			10/5/2011
Helen Wong-Armijo	Auction 39	84	10/5/2001	10/5/2001	10/5/2011	10/5/2006			10/5/2011
PCS Partners, L.P.	Auction 39	32	7/25/2003	11/25/2004	7/25/2013	7/25/2008			7/25/2013
FCR, Inc.	Auction 21	5	7/14/1999	11/18/2003	7/14/2009	7/14/2004	Granted	7/14/2007	7/14/2009
	Auction 39	8	10/5/2001	11/18/2003	10/5/2011	10/5/2006			10/5/2011

Source: FCC Universal Licensing Database (ULS).

Table compiled by Naveen Lakshmipathy

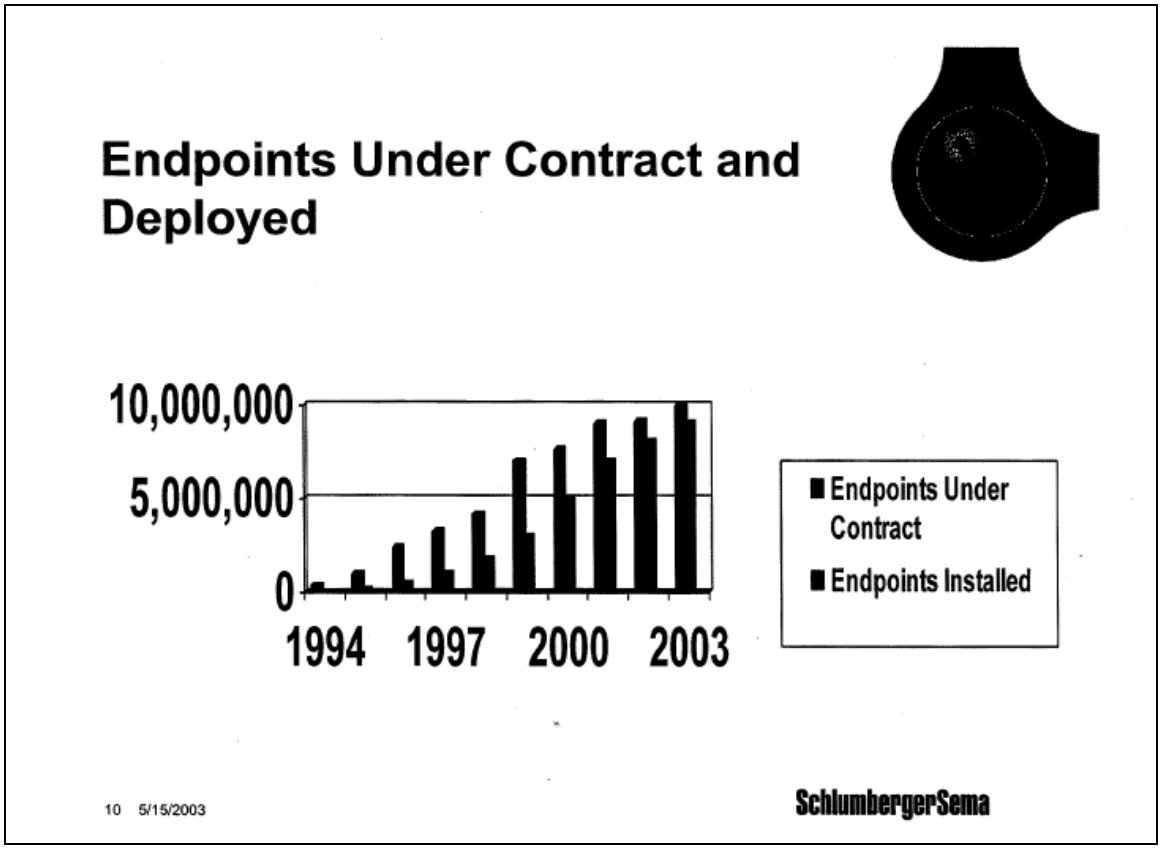
Appendix D: Growth of Itron's Installed Unlicensed Meter Devices in the 902-928 MHz Band





Taken from *Ex Parte* Comments of Itron, Inc., RM No. 10403, June 4, 2003.

Appendix E: Growth of SchlumbergerSema's Installed Unlicensed Meter Devices in the 902-928 MHz Band



Taken from *Ex parte* Comments of SchlumbergerSema, Inc., RM No. 10403, May 15, 2003, p 10.